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The effectiveness of individually prescribed microteaching training modules in the acquisition of selected teaching behaviors is being studied in two different contexts: during the preinternship year in the Master of Arts in Teaching Program, Johns Hopkins University, and during student teaching in Teacher Education Centers, University of Maryland. It is hypothesized that the experimental (microteaching) groups (1) will acquire a significantly greater number of selected, specific teaching behaviors, (2) will have a significantly higher indirect-direct ratio, (3) will acquire a greater number of alternative teaching patterns, and (4) will make a significantly greater number of "emitted" responses. The final report will compare seven teaching performances of five trainee groups; preliminary findings have been analyzed for one comparison between 10-minute, video taped samples of teaching performance (1) of the control group (22 randomly selected interns who had one summer of student teaching but no microteaching before their internship) during the eighth and 12th weeks of their internship and (2) of a microteaching group (10 interns who had one semester of course study and microteaching before internship), on a final microteaching lesson prior to internship. Three different instruments were used for coding and scoring data before t test analysis. Findings support hypotheses 1 and 3. (JS)

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THE EFFECTIVENESS OF INDIVIDUALLY PRESCRIBED MICRO-TEACHING TRAINING MODULES ON AN INTERN'S SUBSEQUENT CLASSROOM PERFORMANCE

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The purpose of this study is to assess the effectiveness of individually prescribed micro-teaching training modules in the acquisition of selected teaching behaviors prior to classroom teaching experience and subsequent implementation of these behaviors in classroom teaching. This is a preliminary report of the study to be completed in the Fall semester of 1969.

Rationale

Prior to the development of micro-teaching, specific teaching behaviors (skills) were primarily "caught" rather than taught as the teacher was immersed in full classroom teaching. The novice teacher out of frustration often resorted to imitating and adopting a supervising teacher's "style" of teaching without regard for his own individuality or the teaching-learning situation.

The micro teaching concept as developed at Stanford University (Bush and Allen, 1963) consisted of a predetermined sequence of micro-teaching sessions for the acquisition of selected teaching skills. In this way, the novice teacher acquired a set of specific teaching behaviors and began developing a "style" of his own. Stanford studies indicate that performance in micro-teaching situations predicts subsequent classroom performance at a significant level ($p < .001$ chi square predictive

relationship). Predictions are made on an eight item TDR "global" rating instrument of teaching performance (Allen and Fortune, 1964). Fortune et. al. (1967) report significant gains ($p < .01$) on selected teaching skills over the six week course of the clinic.

Novice teachers display considerable variability in their repertory of teaching behaviors on an initial diagnostic performance. For example, when requested to teach a lesson representative of their teaching ability, one person may lecture; another may conduct a question-and-answer session based on recall. Still others will use different skills. Some will incorporate several skills into their teaching. Let it suffice to say that teacher candidates do not possess like repertories of teacher behavior. We must also state the obvious--all teacher candidates do not acquire teaching skills at the same rate.

The novice teacher's induction into the teaching profession is often accompanied by considerable trauma, discouragement, and failure. This is due in large measure to the sudden immersion into the complexities of teaching a sophisticated concept to thirty or more pupils, each manifesting different psychological, cultural, and sociological orientations. The way the novice teacher has been inducted into teaching would be analogous to training airline pilots if they took up a full load of passengers the first day after pilot school.

Micro-teaching, simulation, focused observation, etc. can provide graduated experiences for a teacher trainee. However, these experiences are often common for all trainees without first assessing each person's teaching ability or repertory of teaching skills.

If teachers are to compete with machines they need to perform in ways a machine can not. A machine can not discriminate between one individual and another unless a specific button is pushed which would yield a previously

programmed response. The classroom teacher must be equipped to initiate as well as to respond in any situation confronting him. He must be flexible! He must be able to make professional decisions based on a thorough analysis of "personalogical" factors of both pupils and himself, the content, conditions of learning, etc., arriving at strategies which are designed to meet each learning objective.

However thorough the analysis may be and complete and flexible the strategies, if the teacher can not execute these alternative strategies in the classroom he has been reduced to a machine. If one follows this line of reasoning, teacher educators are obligated to provide teachers the opportunity to acquire as full a repertoire of alternative teaching behaviors as possible. Although this study is concerned only with the acquisition and practice of specific teaching behaviors in a constructed teaching-learning situation, the entire spectrum of teacher education activities should be on an individually diagnosed and prescribed basis wherever feasible.

Description of the Study

The effectiveness of individually prescribed micro-teaching training modules is being studied in two different contexts: during the pre-internship year in the Master of Arts in Teaching Program, The Johns Hopkins University and during student teaching in Teacher Education Centers, University of Maryland.

Pre-internship - Johns Hopkins University - The experimental group is comprised of 40 interns who are in their academic year or semester preceding the internship. One group of 30 interns in this academic year (1968-69) are involved in course work and micro-teaching prior to their semester (Fall, 1969) of internship the following academic year. The other group of 10 interns have one semester (Fall, 1968) of course study and micro-teaching followed by a semester (Spring, 1969) internship. The present study is limited to the

one-semester micro-teaching group. The final report will include both groups.

The control group consists of 22 randomly selected interns who began their classroom internship during the Fall semester, 1968. The control group did not have micro-teaching before or during their internship. They participated in an observation-teacher aide-student teaching experience during the summer, 1968.

The present report consists of a comparison of ten-minute, video-taped samples of teaching performance of the control group between the eighth and twelfth weeks of their internship and the one-semester micro-teaching group on a final micro-teaching lesson three weeks prior to beginning their classroom internship.

The final report will consist of a comparison of the following teaching performances:

1. A control group sample between the eighth and twelfth week of the internship (included in present study).
2. A control group sample during the final three weeks of the internship.
3. The one-semester and academic year micro-teaching group's first diagnostic performance and final micro-teaching lesson.
4. The one-semester micro-teaching group's internship performance during the first three weeks of internship and during the final three weeks of internship.
5. The academic year micro-teaching group's internship performance during the first three weeks and during the last three weeks of the internship.

Interns in the experimental group prepare and teach a five-minute diagnostic lesson to a group of four pupils. This performance is coded

using a modified version of Hough's Observation System for classroom analysis (Amidon and Hough, 1968) and Dimensions of Teacher Behavior (University of Maryland, 1969) and Performance Criteria for Micro-Teaching (Young and Young, 1969). These same instruments are used for subsequent diagnosis and analysis and will be referred to collectively as the instruments.

Based on the foregoing analysis and inventory, a series of micro-teaching training modules are prescribed for the acquisition and practice of selected teacher behaviors. These modules are not dictated to the intern but are mutually determined during the playback and conference of the diagnostic and each subsequent conference during the series. With the exception of the one-semester group, the interns teach a "mid-year" diagnostic lesson which is analyzed and another series of modules are prescribed.

The micro-teaching sessions are held in private and public schools in Baltimore City and County. Students are obtained from study halls, released time activities and in some cases, classes. Each time an intern teaches, it is to a different group of pupils.

Typical Micro-Teaching Training Modules - The research on micro-teaching indicates that a variety of formats has been effective in modifying a teacher's behavior (Allen et. al, 1967; Orme, 1966; Young, 1968, 1969; Fortune et. al., 1967). There is some evidence that different teaching behaviors can be more effectively taught in one format than another but the results are far from conclusive. The development of the following modules and conference strategies is based upon the above studies and the experience of the authors.

1. Basic module - This consists of a teacher teaching a 5-10 minute lesson to 4 pupils. The performance is video taped

and played back immediately. During the ensuing conference and video-tape playback, the supervisor focuses on one specific teaching behavior providing discrimination training and reinforcement. The teacher reteaches the same lesson again to a different group of pupils attempting to use alternative components of the same dimension of teaching behavior. Following the reteach, a confirmation conference is held.

2. Extended Basic Module - This format is the same as above but the teacher may reteach two or three times if he has not reached criteria for that specific behavior.
3. Multiple Modules - Within a two hour period of time, a teacher may combine modules 1 and 2 above and concentrate on two or more specific teaching behaviors working from one basic lesson which is repeatedly taught to different students.
4. Alternative Conference Strategies - In addition to the supervisor providing discrimination training and reinforcement on the teacher's own performance between teaching sessions, a variety of modelling protocols are also used. Three basic kinds of models are used: video tape, audio tape, and written. The models are a constructed teaching-learning situation in a micro-teaching format. The model presents a specific teaching behavior which is exaggerated, and competing and distracting stimuli (behaviors other than the one desired) are limited The video-tape models are viewed by the teacher with the supervisor or alone. In the latter case, the model is self-instructional. The viewer is focused on the specific teaching

behavior by means of an auditory and/or visual prompt. For a review of the research and detailed description of modelling, see Young, 1969.

Pre-Micro-Teaching Seminars - Instructional sessions are held prior to some micro-teaching sessions. During these sessions, the criteria for a specific teaching behavior are developed; and models may be shown. These seminars are normally conducted when a specific teaching behavior will be the focus for all interns during the next micro-teaching session. This was the case for the specific teaching behavior, "Orientation of Pupils to the Learning Task". The diagnostic of the academic year micro-teaching group revealed that only two teachers used the skill. Consequently, a basic micro-teaching module was prescribed for all interns.

Teacher Education Centers - University of Maryland

The University of Maryland has established Teacher Education Centers which are comprised of several public schools geographically contiguous. The Teacher Education Center concept is unique to the extent that it focuses on continuous educational personnel development and is cooperatively developed and administered by the University and public school. The University personnel assume major responsibility for training Center faculty for a significant role in the induction of student teachers into full time, professional teachers. Coordinating this program and located in the Center is a full-time, joint appointee of the University and school. It is within this context that the establishment of individually prescribed micro-teaching training modules will also be studied. During the Spring semester, 1969, twelve student teachers will be placed in two Teacher Education Centers. Concurrent with the micro-teaching and subsequent student teaching phase of the semester, both general and specific method courses will be taught. All student teachers in this experience will teach a diagnostic lesson

the third day of the semester. The procedure for diagnosing and prescribing will be similar to that described above. One exception to that--the instructional seminars will be a part of the ongoing "methods" instruction. The second exception will be that only a portion of the prescribed modules will occur prior to some classroom teaching. Once student teachers begin classroom teaching, the prescription of training modules will be based on their performance in the classroom as well as their past performance in micro-teaching sessions. A comparison will be made of the student teachers' diagnostic teaching performance and their performance during the last two weeks in the Center. These data will be analyzed using the instruments described above.

Prescribed Micro-Teaching Training Modules

The present report includes only those modules prescribed for the one-semester micro-teaching group:

Specific Teaching Behavior	Number of Interns	Seminar	Type of Module	Conference Strategy
Establishing Orientation to the Learning Task	10	Yes with Model	1	Discrimination Training
Probing	4	No	3	Video-Tape Model Discrimination Training
Reinforcement	5	No	2	Discrimination Training
Closure	3	No	3	Written Model Video-Tape Model Discrimination Training
Higher Order Questions	7	No	2	Written Model Discrimination Training
Non-Verbal Cues	3	No	3	Video-Tape Model Discrimination Training

Hypotheses

I. The experimental (micro-teaching) group will acquire a significantly greater number of selected, specific teaching behaviors.

II. The experimental (micro-teaching) group will have a significantly higher indirect/direct ratio.

III. The experimental (micro-teaching) group will acquire a greater number of alternative teaching patterns.

IV. Students in the experimental (micro-teaching) group will make a significantly greater number of "emitted" responses.

Collection and Analysis of Data

The data was collected for this report by video taping a ten-minute sample of the interns in the control group in the classroom between the eighth and twelfth week. These recordings were coded using Hough's Observation System for the Analysis of Classroom Instruction and Performance Criteria for Micro-Teaching. A sample of a Specific Teaching Behavior is illustration in the Appendix.

Only the performance criteria for specific teaching behaviors taught in the micro-teaching modules were used. The final micro-teaching performance of the one-semester micro-teaching group was also video taped and subjected to the same analysis.

In the present study, interrater reliability was determined by using the procedure described by Scott (1955). Coefficients of .80 and above were obtained.

In this preliminary report, the "t" test was used to compare the percentages of time teachers in both groups spent in each of the sixteen

categories. The "t" test was also employed to compare the mean score differences between the two groups of selected performance criteria and selected interaction analysis ratios.

In addition to the above, more sophisticated statistical measures will be used in the final report.

Test of Hypotheses

The first hypothesis--the experimental group will acquire a significantly greater number of selected, specific teaching behaviors. On the basis of the preliminary findings, the data in Table I indicate that interns in the micro-teaching group performed selected teacher behaviors at a significantly higher mean frequency than those in the control group.

TABLE I

Comparison of Performance of Selected Specific Teaching Behaviors

Behavior	Micro Teaching	Classroom	t	Significance Level
Total Reinforcement	$\bar{M}$ 21.4	$\bar{M}$ 11.9	2.93	.005
Number of Different Reinforcements	$\bar{M}$ 3.78	$\bar{M}$ 2.0	3.79	.005
Establishing Orientation to the Task	$\bar{M}$ .78	.18	8.57	.0005
Probing	$\bar{M}$ 5.44	$\bar{M}$ 1.55	3.70	.005
Closure	$\bar{M}$ .67	$\bar{M}$ .18	2.58	.01

The second hypothesis--the experimental group will have a significantly higher indirect/direct ratio. Hypothesis II was not supported by a test of the difference of means for the two groups. The micro-teaching group did

reach significance at the .10 level when applying the Revised Indirect/Direct ratio (categories 1-3 to 7-9). Table II illustrates the comparison of the micro-teaching and classroom teacher groups on both the Indirect/Direct and Revised Indirect/Direct ratios.

TABLE II

Comparison of Micro-Teaching and Classroom Samples of Teachers

REVISED INDIRECT/DIRECT RATIO

Micro-Teaching	Classroom	Mean	t
.00	13.00		
19.00	2.25	Micro-Teaching	
2.50	.00	7.73	1.57
.00	9.00		Significant
25.00	.00	Classroom	at the .10
11.00	1.50	3.23	level
.00	.87		
8.00	3.40		
4.00	.00		
	3.00		
	2.50		

INDIRECT/DIRECT RATIO

3.69	1.95		
.27	4.50	Micro-Teaching	
1.21	3.78	2.41	Not
3.75	3.92		Significant
2.53	2.66	Classroom	
2.00	1.58	2.55	
4.70	1.95		
1.08	1.51		
2.44	.28		
	5.70		
	.24		

The third hypothesis--the experimental group will acquire a greater number of alternative teaching patterns. Using the rules for determining major and minor teaching patterns with extensions (Amidon and Flanders), the composite matrix of teachers in the micro-teaching group exhibits both a major and minor pattern. The major pattern consists of 4-10-2-4 (teacher question-student elicited response-teacher praise-teacher question) and a minor pattern, 4-11-2-6-4 (teacher question-student emitted response-teacher praise-teacher lecture-teacher question). The composite matrix of teachers in the classroom group shows only a major pattern. Although the evidence is not conclusive, the dual pattern does suggest a greater degree of flexibility in the micro-teaching group. This tends to follow the rationale provided in the introduction of this paper; namely, if teachers have a larger repertory of specific teaching behaviors, they can behave with greater flexibility in the classroom. Figures 1 and 2 show the micro-teaching and classroom teaching patterns.

The fourth hypothesis--students in the experimental group will make a significantly greater number of "emitted" responses. An inspection of Figure 3 indicates that the subjects in the micro-teaching group did make a significantly greater number of emitted responses and a significantly lesser number of elicited responses. Figure 3 illustrates graphically how the percentage of tallies compare for the teachers in both groups with respect to the verbal response in the sixteen categories.

Analysis and Discussion

A composite matrix showing the average percentage of total tallies for the micro-teaching group is presented in Table III. Also, Table IV shows the composite matrix for the control group. The total of each column indicates the average percentage of tallies recorded for that category and

Figure 1

Matrix of Classroom Group Showing Teaching Pattern

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1																
2		9	12	57		15	1	5		3	4	1	6	1	1	
3			5	6		4					1					
4		10	1	111		17		7	10	80	18	2	2	13	1	1
5				3	8	3				8		5				
6		2		36		148		5		2		8	8			2
7			7	3		2	2			3						
8				11				10		5	2	1		2		1
9				1							1					
10		68		12	1	25	4	1		11		1	3	2		
11		18		4		2				1	39				1	
12				3	12	5	1	1			1	11	3		1	
13				7		10		2		3		1	7			
14				10		3		1		4				9		
15				3		3									5	
16				3		2										2
Total		108	25	270	21	239	8	32	10	221	66	29	29	27	9	6

Major Teaching Pattern = 4-10-2-4

Minor Teaching Pattern = 4-11-2-6-4

Figure 2

Matrix of Micro-Teaching Group Showing Teaching Patterns

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1				1												
2		2	7	56		36		1		11	18		1		1	
3			5	5		2					3		1			
4	1	1		59		11	1			70	67	2	4	10	3	
5						1					1					
6			1	50	1	126		1			10		1	1	3	
7				1		2										
8				4		1		1			12					
9																
10		65		14		5	1				1	1	3		2	
11		62	3	25		7	1	3			42		12			
12					2			1								
13				3		5		1			13	1	2			
14				7		2						1		2		
15			3	3		2		1								
16																
Tota	1	130	19	228	3	200	3	9		99	157	5	24	13	9	

Figure 3

Comparison of Categories

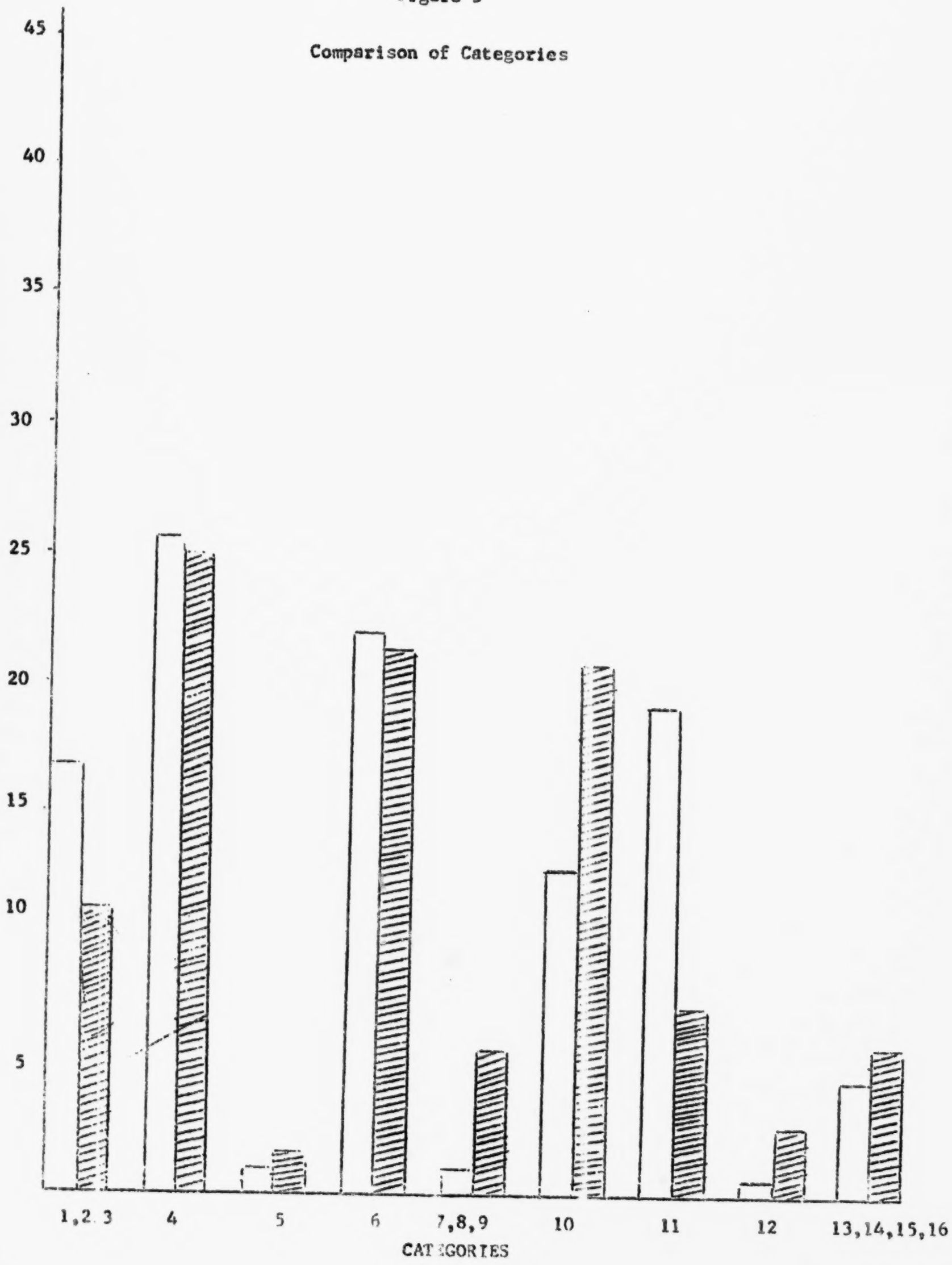

TABLE III

Composite Matrix of Micro-Teaching Group in Percentages

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1				.001												
2		.002	.007	.062		.040		.001		.012	.020		.001		.001	
3			.005	.005		.002					.003		.001			
4	.001	.001		.065		.012	.001			.077	.074	.002	.004	.010	.003	
5						.001				.001	.001					
6			.001	.055	.001	.140		.001		.005	.011		.001	.001	.003	
7				.001		.002										
8				.004		.001		.001			.002					
9																
10		.072		015		.005	.001			.008	.001	.001	.003		.002	
11		.068	.003	.02		.007	.001	.003			.046		.013			
12					.002			.001		.001						
13				.00		.005		.001		.001	.014	.001	.002			
14				.00		.002				.001		.001		.002		
15			.003	.00		.002		.001		.001						
16																
TOTAL	.001	.144	.021	.253	.003	.222	.003	.010		.110	.174	.005	.026	.014	.010	

TABLE IV

Composite Matri: of Classroom Teaching Group in Percentages

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1																
2		.008	.012	.05:		.014	.001	.005		.003	.004	.001	.001	.001	.001	
3			.005	.00:		.004					.001					
4		.009	.001	.10:		.016		.006	.009	.073	.016	.002	.002	.012	.001	.001
5				.003	.007	.003				.007		.005				
6		.002		.033		.148		.005		.002		.007	.007			.002
7			.006	.003		.002	.002			.003						
8				.010				.009		.005	.002	.001		.002		.001
9				.001							.001					
10		.062		.011	.001	.023	.00:	.001		.102		.001	.003	.002		
11		.015		.004		.002				.001	.035				.001	
12				.003	.010	.005	.001	.001			.001	.010	.003		.001	
13				.006		.009		.002		.003		.001	.006			
14				.009		.003		.001		.004				.010		
15				.003		.003									.005	
16		.001		.003		.002										.002
Total		.098	.02	.246	.019	.217	.007	.029	.009	.201	.060	.026	.026	.025	.008	.005

is a measure of the percentage of time teachers use a particular category.

The "t" test was used to determine the significance level for the sixteen categories under the Hough Observation System, (Figure 3). Those categories reaching significant levels, along with their respective means, are repeated here.

Category	Micro-Teaching	Classroom	Level of Significance
1-2-3	$\bar{M}$ 16.66	$\bar{M}$ 11.91	t 1.5 @ .10
7-8-9	$\bar{M}$ 1.33	$\bar{M}$ 3.82	t 1.63 @ .10
10	$\bar{M}$ 11.00	$\bar{M}$ 21.70	t 4.35 @ .0005
11	$\bar{M}$ 17.40	$\bar{M}$ 5.91	t 1.92 @ .05

It is interesting to note that the control group has a very high level of significance in category 10 (student-elicited response) whereas the micro-teaching group shows significance in category 11 (student-emitted response). Referring back to the composite matrix, Table III, for the micro-teaching group, it is evident from the steady state cell (11-11) that approximately one-fourth of the total in column 11 was representative of continuous student talk. This suggests that this class time was not dominated by a few students for a considerable length of time.

Categories 7-8-9 (corrective feedback, directions and commands, and criticism) were used more than four times as often by the control group as by the micro-teaching group. The distribution of the control group shows a large part of this difference due to the 8-8 cell (continuous teacher directions and commands) and also directions preceded by teacher questions. An assumption here is that the control group teachers tended to avoid the use of silence after a teacher question and instead, filled in with additional directions and/or commands. Some attention was given to the

micro-teaching group in the use of silence after a teacher question, attempting to promote thinking and contemplation on the part of the students.

Categories 1 and 3 for both groups are quite similar but it is interesting to note that the micro-teaching group almost evenly divided their use of praise between cells 10-2 and 11-2. It is assumed the type of response had little effect on the amount of teacher praise. This could, in part, be the reason for the micro-teaching group's having both a major and minor teaching pattern.

Conclusions

The results of the preliminary study indicate that teacher candidates receiving individually prescribed micro-teaching training modules will acquire and implement a significantly greater number of specific teaching behaviors than candidates not receiving such training.

The results also suggest that teachers trained in this manner will be more flexible and will exhibit alternative teaching patterns.

These are preliminary findings and should in no way be considered conclusive.

Appendix

Performance Criteria for Micro-Teaching

Specific Teaching Behavior: Maintaining Pupil Task-Oriented Behavior

This specific teacher behavior includes teaching behaviors which elicit and/or reward task-oriented pupil behavior and stop non-task oriented pupil behavior. Task-oriented pupil behavior is defined as the attending, working, and participatory behaviors of pupils determined essential to the learning task.

Teacher Behaviors

In an instructional setting, the teacher may:

1. guide pupils in setting classroom behavior norms and procedures for monitoring.

2. direct pupils (independently and together) in a self-appraisal of their task-oriented behavior.

3. systematically assess the attending and participatory behaviors of each pupil by observing pupils' posture, direction of gaze line, substance of student responses, etc.

4. given an instance of non-task oriented behavior, discriminately implement the following behaviors in terms of individual pupil needs and the influence of the non-task oriented behavior on other students and the projected effect of the control technique (ripple effect):

   (a) Desistance Behaviors - The teacher makes a direct attempt to stop the non-task oriented behavior by:

      1. pointing out the deviant behavior.
      2. addressing the pupil.
      3. removing distraction.
      4. making a statement to desist.
      5. exhibiting non-verbal disapproval.
      6. approaching the deviant.

   (b) Prompted Reward Behavior - The teacher ignores the deviant behavior and induces and reinforces task-oriented behavior by:

      1. reinforcing a student's instructional response.
      2. reinforcing a response of the non-deviant.
      3. reinforcing a response to the redirected question to the non-deviant.
      4. reinforcing the desired behavior.
      5. administering a general reward to the class.

(c) Withholding Sanctions - The teacher ignores the non-task oriented (deviant) behavior when he is aware that it has occurred and may:

1. direct a content-related question to the deviant.
2. direct a question to a non-deviant.
3. incorporate the deviant's response into an instructional point.
4. redirect a question to a non-deviant.
5. request positive behavior.
6. positively sanction behavior that might be construed as deviant.
7. ask a non-content question.

The teacher's acquisition of the behaviors presented will permit him to control deviant behavior as it occurs in the classroom and at the same time induce and reinforce pupils' task-oriented behaviors. A full repertoire of alternative controlling behaviors permits the teacher to discriminately use the behavior appropriate to the situation and the individual pupil.

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